



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,821	10/29/2003	Robert Cochran	200311026-1	9535
22879 7590 04/10/2007 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER VY, HUNG T	
			ART UNIT 2163	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/697,821	<b>Applicant(s)</b> ROBERT COCHRAN	
	<b>Examiner</b> Hung T. Vy	<b>Art Unit</b> 2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. As of entry of the amendment filed on 02/06/2007, claims 1-25 are pending in this application. Upon reconsideration, The Applicant's arguments are not persuasive (see Applicant's argument response below).

**Claim Rejections - 35 USC § 112**

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 10, 18 and 24-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Respect to claims 1, 10, 18 and 24-25, the phrase "non-volatile disk types" and "is used for temporary store" renders the claim indefinite because the claims recites "non-volatile disk" that means a storage system that does not lose data when power is removed from it. The "nonvolatile disk" is used for the task for secondary storage and long-term persistent storage. How can the storage with the long-term persistent storage use in the temporary store. The claims render claim that fails to produce a useful and concrete under U.S. C 101.

**Claim Rejections - 35 USC § 101**

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 1-25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim(s) 1, 10, 18 and 24-25 are directed to a method of managing information storage in a store system. This claimed subject matter lacks a practical application of a judicial exception (law of nature, abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful, concrete and tangible result. Specifically, the claimed subject matter does not produce a useful result and a concrete result below.

(A) a useful result because the claimed subject matter fails to sufficiently reflect at least one practical utility set forth in the descriptive portion of the specification. More specifically, while the described practical utility (utilities) is (are) directed to a method of managing information storage in a store system including non-volatile disk type. Further, The "nonvolatile disk" is used for the task for secondary storage and long-term persistent storage. How can the storage with the long-term persistent storage use in the temporary store so the claimed subject matter relates ONLY to hierarchically inferior storage is used for temporize storage.

(B) a concrete result because the claimed subject matter fails to be limited to the production of an assured, repeatable result. More specifically, the claimed subject matter is not repeatable because the "nonvolatile disk" is used for the task for secondary storage and long-term persistent storage. How can the storage with the long-term persistent storage use in the temporary store.

### **Claim Rejections - 35 USC § 102**

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

Art Unit: 2163

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 and 10-13, 18-22 and 24-25 are rejected under 35 U. S. C. § 102 (e) as being anticipated by Matsunami et al. (U.S. patent No. 6,810,462).

Regarding claims 1, 10, 18 and 24-25, Matsunami et al. discloses a storage system and a method of managing information storage in a storage system comprising: a storage array containing a plurality of storage devices of at least three distinct types including volatile solid stage (Cache memory (CM 14)) and non-volatile disk types in a single array (1700 (FC disk Pool 170 with different level hierarchy such as LDEV0...LDEVk) (see fig. 8)) and having a respective class hierarchy (See fig. 1 and 8 and see column 7, line 1+, and column 10, line 37+ and Examiner asserts that based on hierarchy, the storages have different disk controller as network channel adapters (CHN) 1100, Fibre channel adapters (CHF) 1110, disk adapters (DKA), a share memory 13 and a cache memory (CM) 14 (see fig. 1)); and a controller (11) coupled to the storage device plurality that executes hierarchical storage management and selectively controls (See fig. 1-9 and see column 7, line 1+ and column 10, line 42-60) usage of storage according to distinct storage device type whereby hierarchically (Examiner asserts that based on speed of the memory and disk, the storage management manages usage of storage based on speed (see column 10, line 40-60).

With respect to claims 2, and 11, Matsunami et al. discloses the storage array contains a hierarchy of storage devices of at least three types and having a respective performance hierarchy (see column 7, line 1+).

With respect to claims 3, 12 and 21, Matsunami et al. discloses the storage array contains a hierarchy of storage devices of at least three types 13, 14, 1110, 1700, 1750, 1751, 175n and having a respective economic or cost hierarchy (see column 7, line 1+ and fig. 9).

With respect to claim 4, Matsunami et al. discloses a solid-state cache (14) and shared memory (15) supplying storage as a distinct storage device type for a level of hierarchical storage for a level of hierarchical storage (see fig. 1 as Cache memory (CM 14, (1700 (FC disk Pool 170 with different level hierarchy such as LDEV0...LDEVk) (see fig. 8)).

With respect to claim 5, Matsunami et al. discloses it is inherent that Matsunami et al. discloses relatively higher performance Fibre Channel (FC) storage device supplying storage for a level of hierarchical storage because Matsunami et al. discloses the fibre channel (FC) adapter 1110 for connect with storage device (see fig. 1).

With respect to claim 13, it is inherent that Matsunami et al. discloses at least a volatile-shared memory, a relatively higher performance non-volatile storage, and a relatively lower performance non-volatile storage because Matsunami et al. discloses the cache memory controller (16) and cache (14) and share memory (15). Further, cache memory is always Ram (volatile storage) that holds the temporary storage data waiting for next excused of processor.

Art Unit: 2163

With respect to claim 22, Matsunami et al. discloses a cabinet enclosing (1) the disk array and the controller (see fig. 1).

With respect to claims 19-20, Matsunami et al. discloses a cache memory (14) coupled to the controller (15) and operable as an additional storage in the class hierarchy (see fig. 1).

### **Claim Rejections - 35 U.S.C. § 103**

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6-9, 14-17 and 23 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Matsunami et al. (U.S. patent No. 6,810,462) in view of Michael T. Lobue (Michael T. Lob., Surveying Today's Most Popular Storage Interfaces, 12-2002, IEEE, 0018-9162, page 48-55).

Regarding claims 6-9, 14-17 and 23, Matsunami et al. discloses all limitations of claimed invention recited in claims 1, 10 and 18 except for lower performance serial AT-attached (SATA) storage devices supplying storage for a level of hierarchical storage. However, Michael T. Lobue discloses the serial AT-attached (SATA) storage devices (see page 53). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify Matsunami et al.'s system to use the SATA in order to improve the system storage and a hybrid storage allows a system to

achieve greater economies and storage densities for the stated purpose has been well known in the art as evidenced by teaching Michael T. Lobue (see page 53).

### **Response to Arguments**

6. Applicant's arguments filed on 07/27/2003 have been fully considered but they are not persuasive. Applicant made the following arguments:

- a. "Matsunami et al. which does not disclose "storage devices of at least three distinct types including volatile solid state and non-volatile disk types in a single array" and "hierarchical storage management selectively controls usage of storage according to the distinct storage device type whereby hierarchically inferior storage is used for temporary storage". Claims 18-22 distinguish over Matsunami et al. which does not disclose a "disk array containing an hierarchy of disk adapters and coupled storage disks of at least two types and having a respective class hierarchy" page 7 last paragraph.

The Applicant's arguments are not persuasive because Matsunami et al. discloses storage devices (1) of at least three distinct types including volatile solid state (cache memory CM 14) and non-volatile disk types (1700 (FC disk Pool 170 with different level hierarchy such as LDEV0...LDEVk) (see fig. 8)) in a single array and hierarchical storage management selectively controls usage of storage according to the distinct storage device type whereby hierarchically inferior storage is used for temporary storage (Examiner asserts that based on speed of the memory and disk, the storage management manages usage of storage based on speed (see column 10, line 40-60) and disk array (1700) containing an hierarchy of disk adapters (different level hierarchy



Art Unit: 2163

such as LDEV0...LDEVk ) and coupled storage disks (1700) of at least two types and having a respective class hierarchy (Examiner asserts that based on hierarchy, the storages have different disk controller as network channel adapters (CHN) 1100, Fibre channel adapters (CHF) 1110, disk adapters (DKA), a share memory 13 and a cache memory (CM) 14 (see fig. 1)). Further, Applicant's argument about the rejection 103 are not persuasive because Matsunami et al. in view of Lobue discloses all limitations recites in claimed invention (see rejection and Applicant's argument above).

### Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

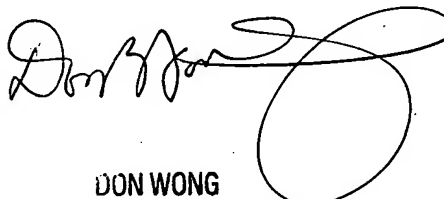
Art Unit: 2163

8. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Vy whose telephone number is (571) 272-1954. The examiner can normally be reached on Monday-Friday 8:30 am - 5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications.

Information regarding the status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either private Pair or Public Pair. Status information for unpublished applications is available through Private Pair only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have question on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hung T. Vy  
Art Unit 2163.  
April 8, 2007.



DON WONG  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100